

## CLAIMS

1. A high frequency module, characterized by comprising: a first main waveguide; a first T-branch circuit connected to the first main waveguide; a first low-pass filter connected to the first T-branch circuit for transmitting a first frequency band and reflecting a second frequency band; a band-pass filter connected to the first T-branch circuit for transmitting the second frequency band and reflecting the first frequency band; a first converter connected to the first low-pass filter for converting transmission lines between a waveguide and a microwave integrated circuit; an amplifier connected to the first converter and structured by the microwave integrated circuit; a second converter connected to the amplifier for converting transmission lines between a waveguide and the microwave integrated circuit; a second low-pass filter connected to the second converter for transmitting the first frequency band and reflecting the second frequency band; a second T-branch circuit connected to the second low-pass filter and the band-pass filter; and a second main waveguide connected to the second T-branch circuit.

2. A high frequency module, characterized by comprising: a first main waveguide; a first T-branch circuit connected to the first main waveguide; a first low-pass filter connected to the first T-branch circuit for transmitting a first frequency band and

reflecting a second frequency band; a first band-pass filter connected to the first T-branch circuit and having a partially bent longitudinal axis for transmitting the second frequency band and reflecting the first frequency band; a first converter connected to the first low-pass filter for converting transmission lines between a waveguide and a microwave integrated circuit; an amplifier connected to the first converter and structured by the microwave integrated circuit; a second converter connected to the amplifier for converting transmission lines between a waveguide and the microwave integrated circuit; a second low-pass filter connected to the second converter for transmitting the first frequency band and reflecting the second frequency band; a first bend connected to the first band-pass filter; a second bend connected to the first bend; a second band-pass filter connected to the second bend and having a partially bent longitudinal axis for transmitting the second frequency band and reflecting the first frequency band; a second T-branch circuit connected to the second low-pass filter and the second band-pass filter; and a second main waveguide connected to the second T-branch circuit.

3. A high frequency module, characterized by comprising: a first main waveguide; a first T-branch circuit connected to the first main waveguide; a first band-pass filter connected to the first T-branch circuit for transmitting a first frequency band and

reflecting a second frequency band; a second band-pass filter connected to the first T-branch circuit for transmitting the second frequency band and reflecting the first frequency band; a first converter connected to the first band-pass filter for converting transmission lines between a waveguide and a microwave integrated circuit; an amplifier connected to the first converter and structured by the microwave integrated circuit for converting transmission lines between a waveguide and the microwave integrated circuit; a second converter connected to the amplifier; a third band-pass filter connected to the second converter for transmitting the first frequency band and reflecting the second frequency band; a second T-branch circuit connected to the third band-pass filter and the second band-pass filter; and a second main waveguide connected to the second T-branch circuit.

4. A high frequency module, characterized by comprising: a first main waveguide; a first T-branch circuit connected to the first main waveguide; a first band-pass filter connected to the first T-branch circuit for transmitting a first frequency band and reflecting a second frequency band; a second band-pass filter connected to the first T-branch circuit and having a partially bent longitudinal axis for transmitting the second frequency band and reflecting the first frequency band; a first converter connected to the first band-pass filter for converting transmission lines

between a waveguide and a microwave integrated circuit; an amplifier connected to the first converter and structured by the microwave integrated circuit; a second converter connected to the amplifier for converting transmission lines between a waveguide and the microwave integrated circuit; a third band-pass filter connected to the second converter for transmitting the first frequency band and reflecting the second frequency band; a first bend connected to the second band-pass filter; a second bend connected to the first bend; a fourth band-pass filter connected to the second bend and having a partially bent longitudinal axis for transmitting the second frequency band and reflecting the first frequency band; a second T-branch circuit connected to the third band-pass filter and the fourth band-pass filter; and a second main waveguide connected to the second T-branch circuit.

5. A high frequency module according to claim 1 or 2, characterized by further comprising a one-side corrugated rectangular waveguide low-pass filter as the waveguide low-pass filter.

6. A high frequency module according to any one of claims 1 to 4, characterized by further comprising an inductive iris-coupled rectangular waveguide band-pass filter as the waveguide band-pass filter.

7. A high frequency module according to any one of claims 1 to 4, characterized in that the T-branch circuit is provided with a matching step at its branch point.

8. A high frequency module according to any one of claims 1 to 7, characterized by being structured by combining two metal blocks to which the main waveguides, the T-branch circuits, the low-pass filters or the waveguide band-pass filters, the band-pass filter or the band-pass filters each having a partially bent longitudinal axis and the bends, and waveguide portions of the converters are bored.

9. A high frequency module according to claim 8, characterized in that the amplifier has one metal plate thereon, and in a gap between the metal plate and an outer wall wider face of the amplifier, a one-side capacitive iris-coupled rectangular waveguide low-pass filter is provided, the waveguide inner walls of which comprise the metal plate and the outer wall wider face of the amplifier.

10. A high frequency module according to claim 8, characterized in that the amplifier has one metal plate thereon, and in a gap between the metal plate and an outer wall wider face of the amplifier, a one-side corrugated rectangular waveguide

low-pass filter is provided, the waveguide inner walls of which comprise the outer wall wider face of the metal plate and the amplifier.

11. An antenna apparatus, characterized by comprising: a primary radiator; an orthomode transducer connected to the primary radiator; a first high frequency module, connected to the orthomode transducer, according to any one of claims 1 to 10; a first diplexer connected to the first high frequency module; a second high frequency module, connected to the orthomode transducer, according to any one of claims 1 to 10; and a second diplexer connected to the second high frequency module.

12. An antenna apparatus, characterized by comprising: a primary radiator; a polarizer connected to the primary radiator; an orthomode transducer connected to the polarizer; a first high frequency module, connected to the orthomode transducer, according to any one of claims 1 to 10; a first diplexer connected to the first high frequency module; a second high frequency module, connected to the orthomode transducer, according to any one of claims 1 to 10; and a second diplexer connected to the second high frequency module.